



THE  
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**1908-09—No. 7**

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THE  
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CROTALARIA JUNCEA.

(PAPERS ON SAN HEMP IN THE PABNA DISTRICT.)

1. *Report on San Hemp in the Pábna District by BABU UMA CHARAN PAL.*
2. *Valuations of San Hemp from the Pábni District by MESSRS. J. N. CHUNDER AND J. FERGUSON.*
3. *Chemical examination and valuations in London of other samples of San Hemp from the same sources, communicated by PROFESSOR WYNDHAM R. DUNSTAN.*

In March last, under the instructions from Mr. I. H. Burkhill, INTRODUC- TORY. Officiating Reporter on Economic Products to the Government of India, I went to the Pábna District to collect information about the state of the *san* hemp industry of the district. I visited all the important centres of the industry, and the following report gives details of the cultivation, methods of preparation of the fibre as pursued in different places and the way in which the fibre is disposed of from the district.

In the district of Pábna, *san* is chiefly grown in the Sháhzádpur LOCALITY. and Ullápárá thánás (both in the Serájganj sub-division), the latter being the largest *san*-producing tract in the district. It is also grown to a certain extent in villages under the jurisdictions of Ráiganj (Serájganj sub-division) and Dulái (Sadar sub-division) police stations, but the quantities produced there are not of much importance.

*San* can be grown in any land where jute or rice can be grown. SOIL, etc. But as water for steeping is of the greatest necessity, especially during the latter part of the cold weather, it is chiefly grown near rivers or *bils* (swamps) which do not dry during this part of the year.

Two kinds of *san* are grown in the district: *Boran* and *Chotna* VARIETIES. The *Boran* variety is grown for fibre. The *Chotna* is not grown for fibre but is ploughed in or cut when green and left on the field

to serve the purpose of manuring which is the chief object for which this variety is grown. Often the cattle are turned into the field to eat the green leaves and twigs of the plant.

**NECESSITY OF SAN CULTIVATION.**

**SAN AS GREEN MANURE FOR JUTE AND RICE.**

**OUTTURN OF JUTE WITH SAN AS A PREVIOUS CROP.**

The cultivation of *san* of both varieties is considered necessary in order to enhance the fertility of the soil before jute or rice is grown. And generally when jute is to be grown *san* is the previous crop. In such cases there is always a greater outturn of jute than otherwise. With *san* as a previous crop, the outturn of jute per bigha (.33 acre) is from 7—8 maunds (576—658 lbs.), but without *san* this outturn falls down to 3—5 maunds (247—411 lbs.). From one field two crops are obtainable: *San* or any other crop, such as gram, sarson, etc., and jute or rice. *San* precedes both jute and rice. It is sown in Kartik (October-November) and harvested in Magh (January-February). Jute and rice are sown in Falgoon-Chaitra (March-April). As stated above the fertility of the soil is increased by growing *san* in a field, and jute or rice grown in such lands give a higher rate of outturn. But generally jute is preferred to be the crop after *san*, as jute is considered more profitable than rice. *San* is not, however, grown in the same field continually for more than two or three years. Because, if successively grown year after year, the outturn of the *san* crop becomes poor and the general practice to remedy this is to raise *san* for two or three years and then gram or sarson takes its place to precede jute or rice.

**METHOD OF CULTIVATION.**

The method of growing *san* is very simple and is almost similar in various places of the district. Two or three ploughings are given in the field and the seed is sown and the field laddered. No hoeing nor weeding is necessary. The method is described in detail under Sháhzádpur.

**AREA AND PRODUCTION.**

The area under *san* in the Pábna District (almost entirely in the Serájganj sub-division) may be estimated at about 80,000 bighas or approximately 27,000 acres. The total annual production may be said to be about 130,000 maunds (4,758 tons); at any rate it cannot be more than 150,000 maunds (5,490 tons). This estimate of production is based on the information obtained from local dealers in the fibre as well as the cultivators, and is calculated as follows:—

	Mds.
Ullápára . . . . .	75,000
Sháhzádpur . . . . .	45,000
Ráiganj and Dulái, etc. . . . .	10,000
 Total . . . . .	130,000

According to the rate of production per bigha the area producing this quantity, viz., 130,000 maunds of *san* fibre, would be approximately 40,000 bighas. It is to be understood that this area is for the *Boran* variety only and if we add as much for the *Chotna* variety, the total area under the *san* crop would come to about 80,000 bighas or approximately 27,000 acres.\* It may also be mentioned here that in the northern part of the district the area sown with the *Chotna* variety is comparatively larger than that sown with the *Boran* variety.

AREA AND PRODUCTION.

Almost the entire production of the district is exported. A small portion, however, is consumed locally, being used for fishing nets, gunnies, and cordage and ropes, especially for towing boats against stream, such ropes being known as *goons*. It is stated at Ullápárá that native merchants chiefly from Dacca, known as the *Gooniáhs* (*i.e.*, dealers in, or manufacturers of, *goons*) come in during the season to purchase the fibre which they carry to their native place where the stuff is made into *goons* or other kinds of ropes.

EXPORT AND LOCAL CONSUMPTION.

#### Sháhzádpur.

The *san*-producing tract within the Sháhzádpur tháná is bounded on the east by the river Jamuná, on the south by the river Burul where it joins the Huráságár (or Ooráságár). If a line is drawn through Sháhzádpur town to the town of Ullápárá, about 12 miles to the north, it is almost the western boundary of the *san*-producing tract in the Sháhzádpur tháná. On the north comes the Ullápárá tháná which is the largest *san*-producing tract in the whole district.

SHÁHZÁDPUR CULTIVATION EXTENT.

In the Sháhzádpur tháná the chief markets for *san* fibre are Kái-juri (on the Huráságár), Belkuchi, Khidirkol, Pangási, and Pora-bári (on the Jamuná), Betkandi, Bhaka, Sarotia (near Serájganj) and Tálgáchi. Of these Kái-juri is the most important centre of *san* trade in this tháná.

Markets.

The variety grown in the Sháhzádpur tháná is chiefly *Boran*—*Variety grown.* the variety grown for fibre only. The *Chotna* variety which is solely grown for green-manuring is also sown in places to the east of Sháhzádpur town.

*San* is sown in Kartik (October-November) when the soil still holds moisture in it. Two ploughings are necessary before the sowing.

Method of growing.

\* This estimate of area is somewhat below that made by the Sub-Divisional Officer of Serájganj, as published in the Forecast of Rabi Crops in Eastern Bengal for 1908-09. The Director of Agriculture says: "The only estimate regarding which any definite report has been received is the *san* hemp. The Sub-Divisional Officer of Serájganj estimates that the area cropped this year in that sub-division is 30,000 acres, against a normal of 29,000."

**BHANZAD-** seed is sown. After sowing the seed a third ploughing is given.  
**CULTIVATION.** The next treatment is laddering and the operation is complete.

**Seed.** For a bigha (33 acre) of land about  $\frac{1}{2}$  maund (katcha weight, a seer=60 tolas) of seed is required. The usual price of a maund of seed is from Rs. 6 to Rs. 8 (8s. to 10s. 8d.). But the price of the seed this year was abnormally high and was from Rs. 10 to Rs. 14 per maund. The seed is imported from Prasádpur (in Rájsháhi district), Purnea and Maldah. The seed produced locally is invariably worm-eaten before it is ripe and cannot, on this account, be utilised. This worm is known as *Chhenga* or *Senga*. The particulars about this pest are given under Ullápárá (see pp. 138—139).

**Insect pest.**

**Labour for sowing.** If labour is hired, the total expenses till the completion of sowing come to about Rs. 2 per bigha.

**Harvest.**

The crop is ready for harvest during Magh-Falgoon (January-February). The time of harvest is indicated by the appearance of flowers and seeds. Then the whole plant is up-rooted or pulled up. A number of plants is tied in a bundle. The bundles are then steeped in water for about a week (from 5 to 7 days).

**Steeping.**

If the soil of the field was very dry or if the crop was left, for any unavoidable reason, on the field for a longer period than necessary, the bark at the butts becomes stiff. In such cases the bundles are first placed in water erect for a day or two and then the whole bundle is steeped in water. The process of retting the *san* fibre is similar to that of jute. One or two bundles are held by the left hand and the butt end is beaten with a piece of wood by the right hand. The fibre then becomes loose and then about 12 inches from the bottom the bundle is broken, the broken stalks pushed away. The fibre thus set free is held by the right hand, several pushings are given and the whole fibre comes out. Water is squeezed out of the bundle of fibre. The bundles of fibre are then hung up in the sun and shaken from time to time in order to make the fibre straight until the stuff is perfectly dry.

**Retting.**

The quantity of the crop produced in a bigha (33 acre) of land is from 100 to 125 bundles. In favourable circumstances the outturn is sometimes so high as 150 bundles. The amount of fibre turned out by a bigha of land is on an average 4 maunds (329 lbs.). If the average price of the fibre is taken at Rs. 6 per maund, the value of the outturn of a bigha comes to about Rs. 24 (32s.).

**Drying.****Outturn per bigha.****Value.***Cost of cultivation, of seed, of preparation of fibre, etc.***Cost of cultivation, of seed, of preparation of fibre, etc.**

(1) As already stated, the cost of ploughing and sowing a bigha of land, if done by hired labour, is about Rs. 2 (2s. 8d.).

(2) The quantity of seed required per bigha is  $\frac{1}{2}$  maund <sup>SHAHZAD PUR.</sup> CULTIVATION. (41 lbs.) the price of which is about Rs. 4 (5s. 4d.), taking the price per maund at Rs. 8 (10s. 8d.).

(3) Assuming six men can harvest the crop of a bigha in a day, and the wages of a man annas 4 per diem, the expenses of harvesting a bigha ('33 acre) is about Rs. 1-8 (2s.).

(4) The expense of carriage to the waterside for steeping <sup>Cost of cultivation, etc.</sup> cannot be ascertained exactly. It varies according to the distance of the field from the waterside. It must be remembered that *san* is grown on fields not far off from the rivers, or *bils*, so that practically this expense of carriage to the waterside is nominal. In certain cases, however, this expense may be taken at Re. 1 (1s. 4d.) per bigha ('33 acre).

(5) The cost of extracting the fibre of the crop of a bigha of land may, on an average, be taken at Rs. 2 (2s. 8d.).

(6) *Rent of the land*.—Although this cannot strictly be called a part of the cost of cultivation still we cannot neglect it, being from Rs. 1-8 to Rs. 2 (2s. to 2s. 8d.) per bigha ('33 acre).

All these expenses may be summarised as follows:—

Summary of  
cost.

	Rs. A. P.
(1) Ploughing and sowing . . . . .	2 0 0 per bigha.
(2) Seed . . . . .	4 0 0 "
(3) Harvesting . . . . .	1 8 0 "
(4) Carriage to waterside . . . . .	1 0 0 "
(5) Retting . . . . .	2 0 0 "
(6) Rent of the land . . . . .	2 0 0 "
(7) Sundry expenses . . . . .	0 8 0 "
Total cost . . . . .	<u>13 0 0</u> "

As already stated, the value of the outturn of a bigha is about <sup>Net profit.</sup> Rs. 24. So that the net profit left to the cultivator is approximately Rs. 11 (14s. 8d.) per bigha ('33 acre).

*San* fibre is generally sold in *hâts*, that is, weekly or bi-weekly TRADE. markets. Cultivators from villages go to the nearest *hât* to sell off their stuff. *Phariahs* or petty dealers purchase the fibre and <sup>Disposal of</sup> *the fibre*. either sell again to some big dealer or export the article direct to Calcutta *via* Goálândo. These *Phariahs* or purchasers also go from village to village and buy the fibre from cultivators and make a

**SHÁHZÁD-PUR TRADE.** higher profit in the bargain than otherwise. The greater portion of the production, it appears, is sold off in this way.

**Sale at Tálgachi.** In the weekly *hát* of Tálgáchi, about six miles to the north of Sháhzádpur, about 200 maunds (138 cwt. nearly) of *san* fibre are sold which are brought here for the purpose from the neighbouring villages, Mashupur, Kampur, Sarisakol, Durgádáhá, Nábábílá, Magurkolá, Silapára, Nariná, Betkandi, etc.

**Commercial qualities and prices.**

Three descriptions of the fibre are sold here:—

No. 1. <i>First quality.</i> —Price about	Equivalent in pukka Rs. 7-8 per maund (katcha weight of 60 tolas a seer).	or standard weight of 80 tolas a seer = Rs. 10 (18s. 4d.) per maund (82-3 lbs.).
No. 2. <i>Medium quality.</i> —Price		
Rs. 6-8 to Rs. 7 per maund (katcha weight).		= Rs. 9-4 (12s. 4d.) per maund (82-3 lbs.).
No. 3. <i> Inferior quality.</i> —Price	Rs. 4-8 to Rs. 6 per maund (katcha weight).	= Rs. 8 (10s. 8d.) per maund (82-3 lbs.).

Number 3 is sometimes assorted to two classes of which the worst qualities are seldom purchased for export.

Samples of these three descriptions were obtained from Tálgáchi, and their chemical examination and commercial valuations are given on pp. 141 and 142-143.

**Sale at Kájuri.**

Kájuri is the biggest *san* market in the Sháhzádpur thána. It is about seven miles to the east of Sháhzádpur and is situated on the Huráságár which dries up during the cold weather and the traffic is carried on by carts only. The goods from this place goes by cart to Sthalchar, a steamer station on the Jamuná, and thence *vía* Gáálánda to Calcutta.

Large quantities of *san* hemp are brought here for sale in the weekly market from villages lying between the Jamuná on the east and the Kakian on the west. Small quantities are also brought here in week days for sale. In the weekly *hát* some five to six hundred maunds of the fibre are sold.

**Purchase by the Chittagong Company.**

The most important buyer of the fibre in Kájuri is the Chittagong Company. The Company send an Agent here every year in January and make the purchase through him, till the end of April, when the *san* season is practically over. The Company have also their Agencies at Khidirkol (on the Jamuná), Sarotia (near Serájganj), Pangási and Porabári (on the Jamuná) in the Sháhzádpur thána, and at Ullápára and Nalka (on the Huráságár) in the Ullápára thána. It is stated that the total annual purchase of the Company from all their Agencies comes to about 30,000

maunds (22,044 cwt.). In Káijuri alone it is about 6,000 maunds SHAHZAD-PUR TRADE.  
(4,408 cwt.).

*San* fibre sold in the Káijuri *hát* is assorted into four classes Sale at Káijuri. according to quality. It is stated that the *san* hemp produced in this locality is superior in quality to that produced in the Ullápárá Commercial qualities and prices. tháná although the latter is the largest *san*-producing tract. This statement seems to be supported by the fact that the local prices for the different qualities of the fibre sold at Káijuri during the time of the visit were found in all cases higher by annas eight than those for their corresponding qualities sold at Ullápárá (see pp. 137 and 139-140). The commercial valuations of the fibre by the Baled Jute Association, Calcutta, and by the Imperial Institute, London, which are given at the end of this report also show that the stuffs from Káijuri carry higher values than those from Ullápárá.

The prevailing prices of the four classes of the *san* hemp sold in the Káijuri *hát* (by the end of March) are as follow:—

No. 1. *First quality*.—Price Rs. 8 per katcha maund (of 60 tolas a seer)=Rs. 11 (14s. 8d.) per pukka maund (of 80 tolas a seer), (82½ lbs.)

No. 2. *Second quality*.—Price Rs. 7-8 per katcha maund =Rs. 10-8 (14s.) per pukka maund.

No. 3. *Third quality*.—Price Rs. 7 per katcha maund =Rs. 10 (13s. 4d.) per pukka maund.

No. 4. *Fourth quality*.—Price Rs. 6-8 per katcha maund =Rs. 8-8 (11s. 4d.) per pukka maund.

The prices at the beginning of the season, that is, during the latter part of January and in February, are generally lower than those given above and are as follow:—

Prices at the beginning of the season, January-February,  
per maund, katcha weight.

No. 1. Rs. 7 0

No. 2. „ 6 8

No. 3. „ 5 0 to Rs. 6 0

No. 4. „ 4 8 „ „ 5 0

Prices about the end of the season, March-April,  
per maund, katcha weight.

Rs. 7 12 to Rs. 8 0

„ 7 1 „ „ 7 8

„ 6 12 „ „ 7 0

„ 6 8

Characteristics of the fibre according to which it is assorted in this *hát* are—

No. 1. Length of the fibre from six to seven feet, colour white, fibre thin and soft and strong at the same time.

Nos. 2 and 3 are assorted according to the degree of inferiority in length, colour, strength, etc., to No. 1.

**SHÁHZÁD-PURB. TRADE.** If *san* is steeped in river water and especially when the water is quite pure the fibre is of good quality and is classed as No. 1 or No. 2.

Chemical examination and commercial valuations of these fibres obtained from the Kájuri *hát* are given on pp. 141 and 144-145.

### *Ullápárā.*

**ULLÁPÁRÁ.** San hemp is grown largely in the Ullápárá tháná wherever water is available during the time of steeping, that is, in the months of Falgoon and Chaitra (February-March).

**Extent.** The river Bural seems to be the western boundary of the *san*-producing tract in this tháná. The Bural is about 20 miles to the west of Ullápárá. It rises from the Ganges and has one branch from the Cholan *bil*. Other rivers traversing this tract are the Phuljhuri and the Muktahár. The Phuljhuri is the most important river which has its water running and is navigable all the year round for country boats. The best kind of *san* fibre is obtained from villages on its banks, viz., Káliganj, Borál, Ullápárá, Sontola, Bunnyákandi, Dumduma, Rámkántapur, Sodái, Nalká, Ghurka, Poraghati, etc. The Muktahár is the other river which becomes stagnant during the cold weather. The *san* fibre of inferior quality is generally obtained from villages on its banks on account of the bad water of the river caused by continued steeping of *san*. The water becomes black and gives off such an offensive smell that one cannot pass by its banks without holding his nose. No fish can live in such waters. This is a source of malaria and had it not been for the annual inundation which carries off all these impurities the locality would have been very unhealthy.

**Method of cultivation, etc.** Cultivation.—The method of cultivation, preparation of fibre, outturn, cost, profit, etc., are practically the same as detailed in the case of Sháhzádpur and is therefore unnecessary to repeat them here.

**Variety.** The *Boran* is the variety grown for fibre. The *Chotna* variety is invariably grown here for green-manuring which is ploughed in, and in such fields jute or rice is grown to get a higher outturn, but preference is always given to jute as already stated. It also appears that the *Chotna* variety is grown to a large extent on the eastern side of the Phuljhuri.

**Import of seed.** The seed is generally imported. Prásádpur in the Rájsháhi district seems to be the centre of supply of *san* seed to the Pábńá district. It is also imported from Purnea and Maldah. Local seed is annually attacked by an insect called *Chhenga* or *Senga* before it ripens and cannot then be utilised. However, the crop sown

early bears fruits which are not attacked by the insect and is used to <sup>ULLAPARA.</sup>  
a very great extent for sowing. But the fruits of the crop sown late  
are always attacked by *Chhenga* which spreads over the fields and a  
very small amount of the seed can with difficulty be obtained which  
has not been worm-eaten. There is one peculiarity of the attack  
of *Chhenga*. As long as the plants remain in the field the insect  
can feed on the soft green seed, but after harvesting the crops,  
the seed becomes hard and the insect can no more live on it and  
disappears. The insect also attacks the bark of plants and  
damages the fibre to some extent. The seed when stored up is  
no more attacked by any insect. The seed is only dried in the sun  
and stored away in any vessel and put in the sun from time to  
time. It would be a great benefit to the cultivators if a remedy  
for this attack could be found, as the price of the imported seed  
is heavy.

Ullápárá is the biggest *san* market in the Pábna District. The <sup>TRADE.</sup>  
other smaller markets in this tháná are Kaliganj, Boral, Nalka,  
Nalcha, Ghurka and Poraghati. <sup>Markets.</sup>

An extensive trade in the *san* fibre is carried on in the town of <sup>Dealers.</sup>  
Ullápárá. There are about fifty dealers in the *san* hemp (they  
are also dealers in jute). Four or five of them carry on the business  
on a large scale, viz., Messrs. Subal Chand Chunder & Co., the  
Chittagong Company, Messrs. Hem Chundra Pal & Co., and  
Messrs. Brijraj Balchand & Co.

Almost the entire stuff purchased by these firms and other <sup>Disposal of</sup>  
petty dealers is sent down to Calcutta, the greater portion of which  
is exported to Europe, only a small portion being sold to the  
mills in the neighbourhood of Calcutta. The Chittagong Company  
make the purchase through their broker and agent and send the  
stuff to Chandpur where it is haled and then exported via Narayan-  
gunge to Chittagong and thence to Europe.

The town of Ullápárá, including other smaller markets in <sup>Quantity</sup>  
this tháná, exports about 60,000 maunds of the fibre annually,  
Ullápárá itself exporting about 30,000 maunds. <sup>exported.</sup>

Two classes of *san* fibre are always distinguished as obtained <sup>Agricultural</sup>  
from two different stages of the plant, viz., the *Phulsan* and the <sup>distinction</sup>  
*Ghanti san*. The plants bearing only flower give *Phulsan* and <sup>of two</sup>  
require five or six days for steeping. The plants bearing seed give  
*Ghanti san* and require nine or ten days in steeping. The best  
kind of *san* fibre is always obtained from the first.

The *san* hemp sold in Ullápárá is divided into four classes <sup>Commercial</sup>  
of the first, second, third and fourth qualities according to the <sup>qualities</sup>  
and prices.

**ULLAPARA.** assortments made in the mills. The following are the particulars  
**TRADE.** of these:—  
**Commercial qualities and prices.**

*First quality.*—This is *Phulsan*, that is, the *san* fibre obtained from plants harvested when flowers only have been formed. If these plants are steeped in running river water the colour, strength, softness, etc., of the fibre is excellent. This description of the fibre is of the first quality: it is white, soft, woolly to the touch, fine and strong. The length of the fibre is an additional important quality. The price of *Phulsan* is about Rs. 7-12-0 per maund of katcha weight (60 tolas = a seer), being equal to Rs. 10-8 (14s.) in pukka weight of 80 tolas a seer or a maund of 82-3 lbs.

*Second quality* is slightly inferior in appearance to the first. There is a good deal of difference in fineness between the first and the second, although there is a difference of a few annas only in price. The reason is that really first quality is rarely procurable and of what passes off as first quality here a greater portion has to be sold as second quality in Calcutta. Price is about Rs. 7-8-0 per maund of katcha weight or Rs. 10-0-0 (13s. 4d.) per maund of pukka or standard weight, i.e., 82-3 lbs. a maund.

*Third quality* is inferior to the second in every respect. Its price is from Rs. 7 to Rs. 7-4-0 per maund of katcha weight or about Rs. 9-8-0 (12s. 8d.) per maund of pukka weight, i.e., 82-3 lbs. a maund.

*Fourth quality.*—This is slightly inferior to the third and is sold at about Rs. 6 per maund of katcha weight or Rs. 8-0-0 (10s. 8d.) per maund of pukka weight, i.e., 82-3 lbs. a maund.

As stated above the fibre of the first quality is obtained from *Phulsan* only when it has been steeped in a running river water, but when the *Phulsan* has been steeped in *bil* or stagnant water, the fibre is inferior in quality and is of the second or of the third quality according as the degree of impurity of water caused by continued steeping. The *san* fibre of the third or of the fourth quality is obtained from the *Ghanti san*, that is, the seed-bearing *san* plant.

*Commercial Valuations of San Hemp from the Pábná District* COMMERCIAL VALUATIONS.  
by Messrs. J. N. Chunder and J. Ferguson.

Samples of the fibre illustrating different qualities as sold in the markets of Ullápárá, Kájuri and Tálgáchi were procured and submitted to the Calcutta Baled Jute Association for experts' opinion. The following is the report on these samples which the Association was so kind as to obtain:—

To

The SECRETARY,  
*Calcutta Baled Jute Association.*

DEAR SIR,

Below we beg to give you approximate values of hemp such as submitted to you by the Officiating Reporter on Economic Products. These are based on prices which have ruled this season and which are about Re. 1 to Rs. 2 per maund higher than average of previous years. There is always a market for these kinds of hemp either by rope-makers, exporters, or fishermen for their nets. We may say that the samples which are returned herewith are rather too small to allow proper handling.

Tálgáchi . . Register No.	{ 30842 No. 1. Good, clean hemp, value Rs. 11 [14s. 8d.] per maund.
	30843 " 2. Very poor, dirty, badly cleaned, value Rs. 6 [8s.] to Rs. 7 [9s. 4d.].
	30844 " 3. Good, clean hemp, almost as good as No. 1, only fibre somewhat broken, value Rs. 10 [13s. 4d.] to Rs. 10-8 [14s.].
Ullápárá . . , ,	{ 30845 " 1. Short fibre, fairly well-cleaned, value Rs. 9-8 [12s. 8d.].
	30846 " 2. Good clean hemp, value Rs. 10-8 [14s.].
	30847 " 3. Clean, but lacks colour, value Rs. 7 [9s. 4d.].

**COMMERCIAL VALUATIONS.**

Kájuri . . . Register No. . .	30848	No. 1. Good, clean hemp, value Rs. 11 [14s. 8d.]
	30849	" 2. Quite as good as No. 1.
	30850	" 3. Very sticky, badly handled fibre, value Rs. 7 [9s. 4d.]
	30851	" 4. Very dirty, weak fibre. Probably would fetch Rs. 5 [6s. 8d.] to Rs. 5- [7s. 4d.] according to demand which very often cannot be got for such low quality.

*Calcutta, 26th April 1909.*

**CHEMICAL EXAMINATION AND VALUATIONS.**

*Chemical examination and valuations in London of other samples of San Hemp from the same sources communicated by Professor Wyndham R. Dunstan.*

**IMPERIAL INSTITUTE.***Results of the examination of San Hemp from India.*

*Imperial Institute No. 28941.—Dated 17th September 1909.*

**Tálgachi samples : No. 1.**

Sample No. I from Tálgachi, Pábuá District, Eastern Bengal and Assam. Regd. No. 30842.  $1\frac{3}{4}$  oz.

*Description.*—The fibre was straw-coloured and of fair lustre, fairly well-cleaned, but somewhat towy at the ends and containing some adherent tissue.

*Strength.*—Fairly good.

*Length of staple.*—7 feet.

*Commercial value.*—£25 per ton (May 1909). [Rs. 13·78 per maund.]

*Remarks.*—With reference to this and the nine following samples, the brokers reported that the prices quoted as the current values of the fibres might be regarded as fully £4 per ton above their normal values, owing to a shortage in the supply.

No. II from Tálgáchi, Pábna District, Eastern Bengal and Assam.  
Regd. No. 30843.  $11\frac{1}{4}$  oz.

CHEMICAL  
EXAMINA-  
TION AND  
VALUATIONS.

Talgachi  
samples :  
No. 2.

*Description.*—This fibre was mostly grey in colour but greenish in parts and of poor lustre. It was not very well cleaned but contained a considerable quantity of woody and other matter.

*Strength.*—Fairly good.

*Length of staple.*—4 feet.

*Commercial value.*—£18 per ton (May 1909). [Rs. 9·92 per maund.]

No. III, from Tálgáchi, Pábna District, Eastern Bengal and Assam. Regd. No. 30844. 7 oz.

No. 3.

*Description.*—The fibre was of very pale straw-colour, and of fair lustre. It was fairly well cleaned.

*Strength.*—Fairly good.

*Length of staple.*—6 feet.

*Chemical Examination*, see p. 145.

*Commercial value.*—£25 per ton (May 1909). [Rs. 13·78 per maund.]

*Remarks.*—In chemical composition and behaviour this sample compared favourably with the samples of *San Hemp* previously examined at the Imperial Institute (compare table at end of report, p. 145).

No. I from Ullápárá, Pábna District, Eastern Bengal and Assam.  
Regd. No. 30845.  $2\frac{1}{2}$  oz.

Ullapara  
samples :  
No. 1.

*Description.*—This was a very pale straw-coloured fibre, of fair lustre and slightly green in parts. It was fairly well cleaned, but contained some particles of adherent tissue, which were easily removed by gentle hackling.

*Strength.*—Good, but rather uneven.

*Length of staple.*—6 feet.

*Commercial value.*—£25 per ton (May 1909). [Rs. 13·78 per maund.]

No. II from Ullápárá, Pábna District, Eastern Bengal and Assam.  
Regd. No. 30846.  $4\frac{1}{4}$  oz.

*Description.*—This fibre was of very pale straw-colour and of fair lustre. It was fairly well cleaned but contained some adherent tissue, which was easily removed on hackling.

*Strength.*—Good, but rather uneven.

*Length of staple.*—5 feet 9 inches.

**CHEMICAL EXAMINATION AND VALUATIONS.***(Chemical examination, see opposite page).**Commercial value.—£24 per ton (May 1909). [Rs. 13·23 per maund.]**Remarks.—This fibre closely resembled No. III from Tálgáchi (Regd. No. 30844) in chemical composition and behaviour.***Ullapara samples:**  
**No. 3.***No. III from Ullápára, Pábna District, Eastern Bengal and Assam.**Regd. No. 30847. 2 $\frac{1}{2}$  oz.**Description.—This was a pale straw-coloured fibre, slightly darker than sample No. 30846. It was fairly well cleaned, but contained some adherent tissue, easily removed by hacking.**Strength.—Good, but rather uneven.**Length of staple.—6 feet 6 inches.**Commercial value.—£23 per ton (May 1909). [Rs. 12·68 per maund.]***Káijuri samples:**  
**No. 1.***No. I from Káijuri, Pábna District, Eastern Bengal and Assam.**Regd. No. 30848. 10 $\frac{1}{2}$  oz.**Description.—This sample consisted of very pale straw-coloured fibre of fair lustre. It was well cleaned and contained less extraneous matter than the other samples.**Strength.—Fairly good.**Length of staple.—5 feet 6 inches.**(Chemical Examination, see opposite page.)**Commercial value.—£27 per ton (May 1909). [Rs. 14·88 per maund.]**Remarks.—This sample closely resembled Nos. 30844 and 30846 in chemical composition and behaviour.***No. 2.***No. II from Káijuri, Pábna District, Eastern Bengal and Assam.**Regd. No. 30849. Weight 8 $\frac{1}{4}$  oz.**Description.—This sample consisted of straw-coloured fibre, of fair lustre and fairly well cleaned, but somewhat gummy and containing some woody fragments.**Strength.—Fairly good.**Length of staple.—6 feet 6 inches.**Commercial value.—£25 per ton (May 1909). [Rs. 13·78 per maund, April 1909.]***No. 3.***No. III from Káijuri, Pábna District, Eastern Bengal and Assam.**Regd. No. 30850. 11 $\frac{3}{4}$  oz.**Description.—This fibre was buff-coloured and of fair lustre, but was not well cleaned. It contained a large amount of woody and other extraneous matter.*

*Strength.*—Fair.

*Length of staple.*—Average 5 feet 3 inches.

*Commercial value.*—£20 per ton (May 1909). [Rs. 11·02 per maund.]

**CHEMICAL EXAMINATION AND VALUATIONS.**

No. IV from Káijuri, Pábna District, Eastern Bengal and Assam.  
Regd. No. 30851. 10½ oz.

Káijuri samples:  
No. 4.

*Description.*—This fibre was grey and had little lustre. It was not well cleaned, and contained a large quantity of woody matter and tow.

*Strength.*—Rather weak.

*Length of staple.*—4 feet to 5 feet.

*Commercial value.*—£17 per ton (May 1909). [Rs. 9·37 per maund.]

*Conclusions.*—The commercial experts to whom the samples **Conclusions.** were submitted confirmed the conclusions, deduced from the results of the chemical examination, that these fibres were of remarkably good quality. They were also particularly satisfactory in respect of length, strength and colour. Several of them, especially Nos. 30842, 30844, 30845 and 30848, were above the average length and were very well prepared.

The fibres represented by the present samples would find a ready market.

It may be of interest to compare the results of the three chemical examinations made in the present instance with the figures obtained for specimens of Burmese and Indian *San* Hemp previously received at the Imperial Institute.

	Registered No. 30844.	Registered No. 30846.	Registered No. 30848.	Burmese San Hemp.	Calcutta San Hemp.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Moisture . . .	8·0	8·3	8·2	9·8	9·4
Ash . . .	0·3	0·3	0·3	3·1	0·6
<i>a</i> —Hydrolysis, loss . .	7·5	6·3	6·7	9·2	10·5
<i>b</i> —Hydrolysis, loss . .	16·0	15·7	15·7	15·8	14·0
Acid purification, loss . .	1·0	1·0	1·4	3·7	1·6
Cellulose . . .	87·9	88·8	87·6	87·5	90·8

**CHEMICAL  
EXAMINA-  
TION AND  
VALUATIONS.**

This comparison indicates that the three samples from Eastern Bengal and Assam were of very good quality and closely resembled those received from Burma and Calcutta. The present samples, however, probably contained smaller amounts of soluble extraneous impurity than the latter, since they suffered smaller loss on  $\alpha_2$ -hydrolysis and acid purification.

